

FACTSHEET

Plant Protection & Quarantine

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Euonymus Scale: Biological Control

Euonymus Plants

Euonymus (pronounced yew-on'-ih-muhss) plants are a versatile and attractive group of ornamentals that grow in many parts of the United States. Euonymus plants are available in many different forms, including bushes, climbing vines, groundcovers, and even small trees. Common types are evergreen, retaining their foliage throughout the winter. In addition to their attractive foliage, several types bear bright red or orange fruits that further enhance the plants' attractiveness. Euonymus plants rank 12th in popularity among the top 20 common ornamentals.

Euonymus Scale

Many types of euonymus are susceptible to a small insect pest commonly known as euonymus scale. Scale insects attach their mouthparts permanently to plants and suck their juices. When euonymus plants are infested with euonymus scale, their leaves change color. Plants with dark green foliage exhibit yellowing of the leaves; variegated types of euonymus sometimes exhibit a pinkish-red color on the leaves. On heavily infested plants, thousands of mature female scales encrust the stems and reduce leaf production. White scale covers of immature males are also readily visible on the leaves.

Without treatment, severe infestations of euonymus scale can kill all or part of the plant. In fact, because these scale attacks are so widespread and so difficult to control, this ornamental is declining in popularity.

Like many pests in the United States, euonymus scale is of foreign origin. Most of the euonymus grown in this country was brought here from Asia during the last 200 years. Undoubtedly, the scale arrived accidentally with early plant importations before the U.S. Department of Agriculture (USDA) began protecting America's plants with agricultural quarantines and inspections at ports of entry. Like

many other pests of foreign origin, euonymus scale left its natural enemies behind when it arrived here.

Control Efforts Against Euonymus Scale

Generally, homeowners and groundskeepers use chemical pesticides and oil sprays to control euonymus scale. But because the scale is well protected by its outer covering, these controls are not totally effective. Materials must be applied several times, and timing is critical. Newly hatched scale crawlers are easy to kill with pesticides, but determining when to apply the pesticides requires a trained eye. If pesticide users miss suppressing the insect at this stage, control of the scale becomes harder. Because of the difficulty in timing applications of pesticides and the high reproductive capacity of the scale, this pest often overwhelms euonymus plants despite chemical control measures.

In 1980, the USDA's Agricultural Research Service (ARS) started a small-farm research project to study biological control of certain scale insects. One of these was the euonymus scale. ARS imported natural enemies from Asia as part of this project. Some of these predators and parasites proved to be successful at controlling euonymus scale in field experiments. Based on the success of this work, ARS recommended that the USDA's Animal and Plant Health Inspection Service (APHIS) implement a nationwide project for the biological control of euonymus scale.

Biological Control of Euonymus Scale

An APHIS Euonymus Scale Biological Control Project was begun in 1991. The goal of this project is to colonize natural enemies of the euonymus scale across the United States. While most APHIS biological control projects deal with agricultural pests associated with large-scale farming operations, this project is the first of its type to be directed toward protecting horticulture, the fastest growing sector of agriculture today. Primarily benefiting growers of euonymus—homeowners, landscapers, and nursery owners and workers—the project has potential for also controlling San Jose scale, a pest of orchard and shade trees, and white peach scale.

APHIS and its cooperators in 35 States are conducting surveys to determine the following in each State:

- Distribution of the pest,
- Density of the pest, and
- Natural enemies already present.

Cooperators will also release imported species of natural enemies at selected locations. Once these natural enemies multiply, they will be redistributed to the rest of the country.

Predators and Parasites

One of the predators of euonymus scale already introduced into this country is a species of lady beetle called *Chilocorus kuwanae*. This natural enemy has been proven effective in reducing and even eliminating heavy populations of euonymus scale. *C. kuwanae* feeds not only on euonymus scale but also on San Jose scale and white peach scale. Each one of these beetles consumes several hundred scale insects during its lifetime.

Another introduced predator of euonymus scale is a beetle called *Cybocephalus nipponicus*. This tiny species is about the size of a pinhead. While not as voracious as *Chilocorus kuwanae*, *Cybocephalus nipponicus* is also useful in controlling populations of the scale.

Parasites can also help suppress euonymus scale. Unlike the predators, which simply gorge themselves on scales, the parasites are more subtle. Tiny parasitic wasps lay their eggs inside the scale insect's body. When the eggs hatch, immature larvae slowly feed on the host. As the parasite completes its development, it eventually kills the scale. Two species of euonymus scale parasites were recently collected in China, and APHIS plans to release them at selected locations across the country.

Once these predators and parasites become well established in the United States, euonymus scale will be controlled biologically. The right combination of natural enemies should ensure that biological control is effective and long lasting. The availability of biological control for euonymus scale means that fewer pesticides will be used in the urban environment. With this safe, natural means of pest control, the attractive and versatile euonymus plants should once again become popular for landscaping.